



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:

OSB1999-0113

February 25, 1999

Mr. Howard Jones
U.S. Army Corps of Engineers, Portland District
Attn: CENWP-EC-E, Mr. Bob Willis
P.O. Box 2946
Portland, Oregon 97208-2946

Re: Biological Opinion on the Caspian Tern Relocation Pilot Project in the Columbia River Estuary,
Clatsop County, Oregon

Dear Mr. Jones:

Enclosed is the National Marine Fisheries Service's (NMFS) biological opinion on the Caspian Tern Relocation Pilot Project as described in the U.S. Army Corps of Engineer's Biological Assessment (BA) dated November 27, 1998. This opinion supersedes the February 16, 1999, biological opinion issued by NMFS to reflect refinements in coordination between agencies undertaking to carry out the pilot project. This opinion addresses Snake River sockeye salmon and Upper Columbia River steelhead, both listed as endangered species, Lower Columbia River steelhead, Snake River steelhead, Snake River fall chinook salmon, Snake River spring/summer chinook salmon, Snake River sockeye salmon, and Upper Columbia River steelhead, all listed as threatened, and Middle Columbia River steelhead, Lower Columbia River chinook salmon, Upper Willamette River steelhead, Upper Willamette River chinook salmon, Columbia River chum salmon and Upper Columbia River spring chinook salmon, all proposed as threatened. This opinion constitutes formal consultation for those listed species and formal conference for those proposed species. The NMFS has determined that the subject action as proposed is not likely to jeopardize the continued existence of all twelve listed and proposed species or destroy or adversely modify their designated critical habitat

Sincerely,

William Stelle, Jr.
Regional Administrator

Enclosure



Endangered Species Act - Section 7
Consultation

BIOLOGICAL OPINION

Caspian Tern Relocation Pilot Project

Agency: U.S. Army Corps of Engineers - Portland District

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: February 25, 1999

Refer to: OSB1998-0113

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I. Background

On November 27, 1998, the U.S. Army Corps of Engineers (COE) sent a letter to Elizabeth Gaar, of the National Marine Fisheries Service (NMFS), requesting informal consultation for habitat alteration activities associated with the proposed relocation of the Caspian tern breeding colony in the Columbia River Estuary, Clatsop County, Oregon. Included with the letter was a Biological Assessment (BA) addressing potential impacts to listed and proposed salmonids in the Columbia River basin.

Caspian terns are a highly migratory bird that are cosmopolitan in their distribution (Harrison 1983). Along the Pacific Coast they winter in Southern California and Baja California and return north to nest (Harrison 1983). Since the early 1900's, the population has shifted from small colonies nesting in interior California and Southern Oregon to large colonies nesting on human created habitats along the coast (Gill and Mewaldt 1983). The largest tern in North America, the Caspian tern weighs about 18 ounces (Haley 1984). The terns arrive at nesting areas in April with nesting starting at the end of the month (Roby et al. 1998). Nests are constructed on bare sand, with a preference for freshly deposited sand. They are piscivorous in nature and require about 165g of fish per day during nesting (one-third body weight). The primary food of terns at the Rice Island colony site is juvenile salmonids (Roby et al. 1998). The susceptibility of juvenile salmonids around the colony may be due to the delay associated with entering salt water and the salt wedge being in the proximity of Rice Island.

Avian predators such as osprey, bald eagles, gulls have historically been found in the estuary. However, rapid increases in newly established Caspian tern and double-crested cormorant nesting colonies on man-made islands in the Columbia River Estuary were noted by NMFS staff at the Point Adams Field Station in the early 1990's. The concern for impacts of increased avian predation on salmonid smolts from these two colonies resulted in requiring the Bonneville Power Administration (BPA) and COE to conduct an analysis of avian predation within the Columbia River Estuary as part of the 1995 Formal Consultation on the Operation of the Federal Columbia River Power System and Juvenile Transport Program (NMFS 1995).

In 1996, research began, conducted by Oregon State University and the Columbia River Inter-Tribal Fish Commission (CRITFC). The annual report (Roby et al. 1998) for the first field season estimated that 6.6 to 24.7 million salmonid smolts were consumed in the estuary by the Caspian tern colony nesting on Rice Island. The wide range is based on the use of different factors for smolt weights, bird numbers and length of time the birds are on the colony that were used in the estimates, rather than a wide confidence interval. Similar factors were applied to nesting cormorants to produce estimates ranging from 2.6 to 5.4 million smolts taken. NMFS biologists estimate that 100,000,000 anadromous salmonid smolts arrived in the Columbia River Estuary in 1997 on their migration to the Pacific Ocean. Terns and cormorants are estimated to have consumed between 9.2 and 30.1 million smolts, or roughly 10 to 30 percent of all smolts in the estuary.

Final numbers are not yet completed for the 1998 nesting season, but early indications are that bird predation in 1998 was similar to 1997. The NMFS felt that these numbers indicated that immediate action must be taken to reduce predation by avian predators and indicated such in letters to the COE dated March 24 and April 14, 1998.

The high level of tern predation is a relatively recent phenomenon, occurring primarily since the late 1980's. Several islands in the estuary being used for nesting by piscivorous birds were created by dredging the navigational channel after the Mt. St. Helens eruption in 1980. There were no nesting terns in the estuary prior to 1984 when about 1000 pairs apparently moved from Willapa Bay to nest on freshly deposited dredge material on East Sand Island. These birds moved to Rice Island in 1986 and have since expanded to over 10,000 pairs (the largest colony in North America). Since 1984, the total number of large piscivorous birds in the estuary has increased from a few hundred cormorants to somewhere in the range of 30,000 terns and cormorants. Most of the increase has been since 1990. The COE intends to continue to utilize Rice Island as a disposal site.

Because of the concerns regarding avian predation and the COE's need to continue to place dredge spoil, NMFS, COE, U.S. Fish and Wildlife Service, BPA, CRITFC, Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife formed the Caspian Tern Working Group (CTWG) to develop and implement immediate actions to reduce avian predation while a long-term management plan could be developed and implemented. Since Caspian terns are protected under the Migratory Bird Treaty Act, the CTWG looked for ways to achieve this reduction that were effective and minimized harm to the birds. The proposed action by the COE is the short term plan developed by the CTWG.

The objective of this Biological Opinion (BO) is to determine whether the proposed action is likely to jeopardize the continued existence of six salmonid species listed under the Endangered Species Act and six salmonid species proposed for listing under the Endangered Species Act (Table 1), or result in the destruction or adverse modification of their designated or proposed critical habitat.

II. Proposed Action

The proposed action is being undertaken in an effort to reduce salmonid mortality associated with the Caspian tern colony located on Rice Island. The consultation covered by this BO is on the relocation of terns to benefit salmonid survival. A consultation with the COE on the issues of dredging and dredge material disposal is currently being undertaken.

The proposed action is the restoration of habitat more favorable to salmonids through seeding 6 acres on Pillar Rock Island, 75 acres on Miller Sands and 180 acres (leaving a 1 acre opening) of Rice Island to dissuade Caspian terns from nesting; clearing 16 acres of habitat on East Sand Island to relocate the tern colony downstream and reduce predation on salmon; harassment of terns from Rice

Island; and the control of nuisance gulls on Rice Island and East Sand Island. Pillar Rock Island and Miller Sands are both located in the vicinity of Rice Island in the area of high juvenile salmonid predation. Neither currently have terns nesting on them. Planting of vegetation on these islands is solely to dissuade the colony from relocating to either island and thereby maintaining current predation levels.

The research team hypothesizes that relocating the colony to East Sand Island, near the river mouth, will shift the tern diet toward alternate species and reduce predation on smolts. There is some evidence that both terns and cormorants feeding near the river's mouth take a higher proportion of alternate species including herring, smelt and surf perch.

The proposed action is designed to relocate at least 90 percent of the tern colony downstream, where the primary food available to them is not juvenile salmonids. The one acre parcel left unvegetated on Rice Island is designed to serve as the means by which the research team can quantify the success of the relocation effort to East Sand Island. A small number of tern chicks need to be raised on Rice Island to enable comparison of feeding strategies between the two sites. A direct comparison between the two sites is essential for a sound, supportable analysis of any change in the feeding strategy and change in predation rates on juvenile salmonids. Gulls will be prevented from preying on tern chicks at Rice Island so that a minimum number of terns can produce just enough chicks to compare predation rates on smolts between the two sites.

Table 1: Species considered in this Biological Opinion

Common Name	Scientific Name	Listing Status
Snake River sockeye salmon	<i>Oncorhynchus nerka</i>	Listed (Endangered)
Snake River spring/summer chinook salmon	<i>O. tshawytscha</i>	Listed (Threatened)
Snake River fall chinook salmon	<i>O. tshawytscha</i>	Listed (Threatened)
Lower Columbia River steelhead	<i>O. mykiss</i>	Listed (Threatened)
Upper Columbia River steelhead	<i>O. mykiss</i>	Listed (Endangered)
Snake River steelhead	<i>O. mykiss</i>	Listed (Threatened)
Upper Willamette River steelhead	<i>O. mykiss</i>	Proposed (Threatened)
Middle Columbia River steelhead	<i>O. mykiss</i>	Proposed (Threatened)
Columbia River chum salmon	<i>O. keta</i>	Proposed (Threatened)
Lower Columbia River chinook salmon	<i>O. tshawytscha</i>	Proposed (Threatened)
Upper Willamette River chinook salmon	<i>O. tshawytscha</i>	Proposed (Threatened)
Upper Columbia River spring run chinook salmon	<i>O. tshawytscha</i>	Proposed (Endangered)

This action is intended to alleviate the substantial mortality of juvenile salmonids resulting from the large tern colony on Rice Island. The CTWG is already working on a long term management plan to reduce all avian predation within the estuary, and information from actions this year will help direct this effort.

III. Biological Information and Critical Habitat

Based on migratory timing, it is not likely that adult and juvenile salmon or steelhead from listed or proposed species above Bonneville Dam, chinook salmon or steelhead (proposed species) from the Willamette River would be present in the area during the proposed construction period.

The proposed action would occur within designated critical habitat for the listed salmon species.

An action area is defined by NMFS regulations (50 CFR Part 402) as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action.” The area within designated critical habitat affected by the proposed action is the mouth of the Columbia River upstream to the area around Puget Island (RM 40), which includes East Sand Island (RM 2-4), Miller Sands (RM 22-25), Rice Island (RM 21-23) and Pillar Rock Island (RM 28). This is the area currently utilized by Caspian terns for foraging, or potentially utilized once the relocation of the colony occurs. This area also serves as a migratory corridor for both adult and juvenile life stages of all listed and proposed species under consideration in this BO. Essential features of the adult and juvenile migratory corridor for the species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions. The essential features this proposed project may affect are water quality, riparian vegetation and safe passage conditions resulting from construction activities.

This action area is within critical habitat for designated species as indicated by references cited in Table 2. References for further background on listing status and biological information can also be found in Table 2.

Table 2. References for additional background on listing status, biological information, and critical habitat elements for the Listed and Proposed Species addressed in this biological and conference opinion.

Species	Listing Status		Critical habitat	Biological Information, Population Trends
	Proposed Rule	Final Rule		
Snake River Sockeye Salmon		November 20, 1991, 56 FR 58619	December 28, 1993, 58 FR 68543	Waples <i>et al.</i> 1991a; Burgner 1991; ODFW and WDFW 1998
Snake River Fall Chinook Salmon		April 22, 1992, 57 FR 34653	December 28, 1993, 58 FR 68543	Waples <i>et al.</i> 1991b; Healey 1991; ODFW and WDFW 1998
Snake River Spring/Summer Chinook Salmon		April 22, 1992, 57 FR 34653	December 28, 1993, 58 FR 68543	Matthews and Waples 1991; Healey 1991; ODFW and WDFW 1998
Upper Columbia River Steelhead		March 10, 1998, 62 FR 11798	February 5, 1999, 64 FR 5740	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Snake River Basin Steelhead		March 10, 1998, 62 FR 11798	February 5, 1999, 64 FR 5740	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Lower Columbia River Steelhead		March 19, 1998, 53 FR 13347	February 5, 1999, 64 FR 5740	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Upper Willamette River Steelhead	March 10, 1998, 63 FR 11798		March 10, 1998, 63 FR 11798	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998
Middle Columbia River Steelhead	March 10, 1998, 63 FR 11798		March 10, 1998, 63 FR 11798	Busby <i>et al.</i> 1995; Busby <i>et al.</i> 1996; ODFW and WDFW 1998

Table 2 (cont). References for additional background on listing status, biological information, and critical habitat elements for the Listed and Proposed Species addressed in this biological and conference opinion.

Species	Listing Status		Critical habitat	Biological Information, Population Trends
	Proposed Rule	Final Rule		
Columbia River Chum Salmon	March 10, 1998, 63 FR 11774		Proposed March 10, 1998, 63 FR 11774	Johnson <i>et al.</i> 1997; Salo 1991; ODFW and WDFW 1998
Lower Columbia River Chinook Salmon	March 9, 1998, 63 FR 11482		Proposed March 9, 1998, 63 FR 11482	Myers <i>et al.</i> 1998; Healey 1991; ODFW and WDFW 1998
Upper Willamette River Chinook Salmon	March 9, 1998, 63 FR 11482		Proposed March 9, 1998, 63 FR 11482	Myers <i>et al.</i> 1998; Healey 1991; ODFW and WDFW 1998
Upper Columbia River Spring Run Chinook Salmon	March 9, 1998, 63 FR 11482		Proposed March 9, 1998, 63 FR 11482	Myers <i>et al.</i> 1998; Healey 1991; ODFW and WDFW 1998

IV. Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of (1) defining the biological requirements and current status of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: (1) collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If NMFS finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' designated critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential element of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat it must identify any reasonable and prudent measures available.

For the proposed action, NMFS's jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS's critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for adult and juvenile migration of the listed salmon under the existing environmental baseline.

A. Biological Requirements and Current Status

The first step in the method NMFS uses for applying the ESA standards of § 7 (a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NMFS also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species NMFS starts with the determinations made in its determinations to list the particular species for ESA protection and also considers new data available that is relevant to those determinations (see Table 2 for references).

The relevant biological requirements are those necessary for the listed species to survive and recover to naturally reproducing population levels at which protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stocks, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are increased migration survival and improved habitat characteristics that function to support successful migration. The current status of the affected listed species, based upon their risk of extinction, has not significantly improved since these species were listed and, in some cases, their status may have worsened due to continuing downward trends toward extinction (see Table 2 for references).

B. Environmental Baseline

The biological requirements of the listed species are currently not being met under the environmental baseline. Their status is such that there must be a significant improvement in the environmental conditions they experience including the condition of any designated critical habitat (over those currently available under the environmental baseline). Any further degradation of these conditions would have a significant impact due to the amount of risk the listed salmon presently face under the environmental baseline.

V. Analysis of Effects

A. Effects of Proposed Action

Some mortality of salmonids resulting from avian predation in the estuary is normal and part of the balance within any ecosystem. Perturbations to ecosystems often result in the balance being upset with substantial impacts to fish and wildlife. In many instances, human intervention is required to reestablish that balance. Reducing avian predation within the estuary to zero is not feasible or necessary. However, the balance has been so significantly shifted regarding avian predation within the estuary that NMFS believes that intervention is required.

Based on available scientific information, NMFS believes that moving the terns off Rice Island and denying them access to Pillar Rock Island and Miller Sands will reduce juvenile salmonid mortality resulting from tern predation. The extent of that reduction is dependent to a great extent on how feeding behavior is altered at the relocation site. The proposed action will not totally alleviate mortality associated with Caspian tern predation in the Lower Columbia River. Based on the data collected by Roby et al. in 1997, roughly 7-25% of all smolts entering the estuary are consumed by terns. Of these, an estimated 244,000 were listed or proposed for listing under the ESA. Preliminary mortality estimates for 1998 indicate that the Caspian tern colony consumed somewhere between 7 and 26

million juvenile salmonids. In 1999, the juvenile out-migration is estimated to include between 6 and 10 million listed fish. Assuming the same consumption ratio as that of 1997, 420 thousand (7% of 6 million fish) to 2.5 million (25% of 10 million fish) listed fish would be consumed by the tern colony.

It is expected that the proposed action will reduce mortality in the area adjacent to Rice Island and to all areas upstream of there. Feeding in this area is almost exclusively targeted on smolts (Roby et al. 1998). Data collected as part of their study indicate that 90% of foraging by Caspian terns nesting on Rice Island occurred within 13 miles of the island. East Sand Island is located roughly 15 miles downstream of Rice Island. Vegetating Pillar Rock Island, Miller Sands and Rice Island should discourage terns from utilizing the area around Rice Island. Pillar Rock Island and Miller Sands currently do not support tern nesting. Since they are relatively close to Rice Island, they are being vegetated to prevent the colony from attempting to shift to them. Therefore, discouraging the use of this area, coupled with the newly created habitat at East Sand Island and the proposed decoying of terns to that island, should shift the colony's foraging behavior resulting in a significant reduction in the amount of smolts taken.

The proposed action is intended to relocate at least 90 percent of the tern colony. Leaving one acre of habitat at Rice Island will still allow for mortality of juvenile salmonids. The extent of that mortality will depend on the amount of terns that ultimately successfully nest there. The target population for the site is 500-1000 pairs. This number was decided on to allow for enough chick survival to quantify the difference in prey composition between the two nesting areas. This information is crucial to determining what future actions are needed to reduce avian predation to more normal levels. Based on Roby et al.'s findings, salmonid mortality attributable to terns nesting on Rice Island in 1999, could range from 42,000 to 250,000 listed salmonids.

The relocation of the colony to habitat created on East Sand Island will increase juvenile mortality in that portion of the river. Currently this area just falls within the feeding range used by Caspian terns nesting on Rice Island. The relocation will center tern foraging around the island. If the relocation of the colony is completely successful, there should be around 9000 pairs of terns (500-1000 pairs will be left at Rice Island) nesting on East Sand Island. If there is no shift in feeding habits, these terns could consume 378 thousand to 2.25 million listed smolts. However, since there is a wider diversity and abundance of prey in this portion of the Columbia River, and any juvenile salmonids found further downriver are not being concentrated due to the saltwater interface, it is expected that the increased mortality will be substantially less than if the colony remained at Rice Island.

Cormorants feeding around East Sand Island have substantially lower numbers of smolts in their diet, 16% compared to 35% at Rice Island (Roby et al. 1998). Although there is no data that indicates that this will hold true for the relocated terns, this is the best scientific information available. In addition, there is indication from the researchers that terns returning from fishing downriver to Rice Island had a higher catch ratio of other fish species than those that returned from upriver of Rice Island. Comparing prey composition of terns nesting on East Sand Island and Rice Island will confirm whether the

relocation was successful in reducing avian predation on juvenile salmonids. If the difference in consumption ratio for terns is similar to that expressed by cormorants, a 20% reduction in mortality could be expected. This would result in the consumption of 302 thousand to 1.8 million listed smolts from the relocated birds on East Sand Island.

Total mortality from the relocated colony and those left on Rice Island could range from 344 thousand to 2 million listed smolts. The placement of vegetation, harassment of terns off Rice Island, alteration of habitat on East Sand Island and control of nuisance gulls in an effort to relocate the colony should result in an overall reduction in loss to predation of between 76 and 500 thousand juvenile salmonids.

Although the mortality related to this project is substantial, it should be remembered that this action is an interim measure, designed for an immediate reduction in juvenile mortality while a long term solution to avian predation can be developed. Continued avian predation on juveniles at 1997-1998 levels will, at a minimum, hinder recovery of listed species. Continued long term avian predation at levels associated with the relocation would also hinder recovery.

The short term affect on various populations of listed species would be a reduction in a specific year class. Salmonids vary in the amount of time spent in the ocean before returning to spawn. Sockeye salmon return at 1-4 years of age (Burgner, 1991), chum salmon at 2-5 (Salo, 1991), and chinook salmon at 2-5 (Healey, 1991), while steelhead return at 2-7 years of age (Shapovalov and Taft, 1954). Provided that the high levels of predation are of short duration, impacts to runs that return to spawn relatively quickly would be of a lesser affect. These runs of fish would have the opportunity to rebound to higher population levels at a much quicker rate than those that come back spread out over multiple years. For runs of fish that return staggered over multiple years, the effects will be of a longer duration, but tempered by the fact that there will be recruitment from subsequent out-migrant year classes into the spawning run.

B. Critical Habitat

There are three critical habitat elements that may be affected by this action: riparian vegetation, water quality and safe passage conditions. The islands affected by this action are either not vegetated or vegetated with low lying shrubs that do not provide much in the way of carbon loading or insect drift to the system. Increased vegetation on the three upstream islands would increase the potential for some carbon loading and insect drift to occur. Rice Island, Miller Sands and Pillar Rock Island will continue to be used by the COE as a disposal site. Modifications to disposal techniques on these islands may allow for some riparian areas to establish over time.

The alteration of habitat on East Sand Island by scarification would be conducted well away from the waterline and in a manner that would not allow for materials to enter the water and affect water quality. Only a small portion of East Sand Island will be modified for tern nesting habitat. The rest of the island will be left untouched to develop naturally.

As stated earlier in this BO, the intent of the habitat alterations on all the islands is to move predatory birds from an area where salmon are the principle prey source to an area that has a higher diversity of prey to alleviate salmonid mortality. A shift in feeding behavior by terns would decrease mortality of juvenile salmonids as they migrate through the estuary, thereby providing safer passage.

C. Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." For the purposes of this analysis, the action area encompasses the Columbia River estuary (Columbia River mile O-40). Future Federal actions, including the ongoing operation of hydropower systems, hatcheries, fisheries, and land management activities are being (or have been) reviewed through separate section 7 consultation processes. In addition, non-Federal actions that require authorization under section 10 of the ESA will be evaluated in section 7 consultations. Therefore, these actions are not considered cumulative to the proposed action.

VI. Conclusion

NMFS has determined that, based on the available information, the Caspian Tern Relocation Pilot Study is the first step to reduce impacts from avian predation and is not likely to jeopardize the continued existence of Snake River sockeye salmon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, Snake River steelhead, Upper Columbia River steelhead, Lower Columbia River steelhead, Upper Willamette River steelhead, Middle Columbia River steelhead, Columbia River chum salmon, Lower Columbia River chinook, Upper Willamette River chinook, and Upper Columbia River spring run chinook or result in the destruction or adverse modification of critical habitat.

Although there will continue to be salmonid mortality by Caspian terns in the estuary, this project was designed as an interim measure to provide some immediate reduction in mortality while a long term plan could be developed. The actions planned by the COE provide for increased survival of salmonids while this plan is developed.

The NMFS reached this conclusion based on: 1) the fact that the biological requirement for increased migration survival by juvenile fish will be potentially improved by the alteration of habitat that allows for relocation of predatory bird species; 2) long term impacts are not expected due to the interim nature of this project; and 2) critical habitat will not be altered to the detriment of migrating juveniles.

VII. Conservation Recommendations

Section 7 (a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitat, or to develop additional information. NMFS believes the following conservation recommendations are consistent with these obligations, and therefore should be implemented by the COE:

1. The COE should work with NMFS to evaluate other methods of dissuading predatory bird usage of this area of the estuary.
2. The COE should develop alternative techniques for disposal at Rice Island that would allow for establishment of a riparian zone on the island.

In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects, or those that benefit listed species or their habitat, NMFS requests notification of the implementation of any conservation recommendations.

VIII. Reinitiation of Consultation

Consultation must be reinitiated if: the amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect listed species in a way not previously considered; the action is modified in a way that causes an effect on listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 CFR 402.16).

IX. References

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X. Incidental Take Statement

Sections 4 (d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; they must be implemented by the action agency in order for the exemption in section 7(o)(2) to apply. The COE has a continuing duty to regulate the activity covered in this incidental take statement. If the COE 1) fails to adhere to the terms and conditions of the incidental take statement, and/or (2) fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

A. Amount or Extent of the Take

The NMFS anticipates that the action covered by this BO will reduce mortality of juvenile salmonids. Based on the best scientific information available, this reduction should amount to between 76,000 and 500,000 juveniles. However, there is more than a negligible likelihood of resulting in take of Listed and Proposed Species because of continued predation by Caspian terns on juvenile salmonids. Effects of

this action are largely unquantifiable, but are not expected to be a long-term effect on the species' habitat or population levels since it is an interim measure. The estimates of mortality are based on utilizing a reduction of consumption ratios from cormorants rather than terns. This is the best scientific and commercial data available at this time that would enable NMFS to estimate the total amount of incidental take to the Listed and Proposed Species. Based on this information, the NMFS anticipates that an estimated 344 thousand to 2 million smolts of these species will be taken by Caspian terns as a result of the tern habitat that will remain in the estuary. This estimate represents a 20% reduction in mortality as compared to the expected mortality if the action is not undertaken.

B. Reasonable and Prudent Measures

The NMFS believes that the following reasonable and prudent measure(s) are necessary and appropriate to minimizing take of the listed and proposed species and/or minimize the adverse modification of designated or proposed critical habitat.

1. The COE shall ensure that the vegetation planted on Rice Island, Pillar Rock Island and Miller Sands is of sufficient density to dissuade tern nesting or provide for harassment of terns off the islands.
2. The COE shall ensure that the habitat altered on East Sand Island shall be of sufficient quality to persuade terns to utilize it as a nesting site.

C. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the COE must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The COE shall monitor plant density on the vegetated islands and take any and all remedial steps necessary (including harassment) to ensure that terns are not nesting outside of the one acre control site on Rice Island and that the colony is limited to 500-1,000 pairs.
2. The COE shall consult with the OSU/CRITFC research team to ascertain if the altered habitat on East Sand Island is suitable for tern nesting.
3. The COE shall maintain vegetation on Rice Island, Pillar Rock Island and Miller Sands until such time as the long term plan is implemented.